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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,462	07/07/2003	Tzu-Chiang Sung	252011-1490	7583
47390	7590	05/31/2005	EXAMINER	
THOMAS, KAYDEN, HOSTEMEYER & RISLEY LLP 100 GALLERIA PARKWAY SUITE 1750 ATLANTA, GA 30339			LANDAU, MATTHEW C	
			ART UNIT	PAPER NUMBER
			2815	

DATE MAILED: 05/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/614,462	<b>Applicant(s)</b> SUNG ET AL.	
	<b>Examiner</b> Matthew Landau	<b>Art Unit</b> 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 May 2005.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3,5,7-11,13,15-17,19,21-25 and 27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,7,15-17,19 and 21 is/are rejected.
- 7) ☒ Claim(s) 9-11,13,23-25 and 27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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## **DETAILED ACTION**

### ***Response to Amendment***

The amendment filed May 9, 2005 has been received and entered. Claim 1 contains the limitation "a fourth lightly doped region of the second type adjacent to the first doped region and beneath the gate". It should be noted that this limitation should have been underlined since it was added to claim by this amendment. Also, claim 5 has been substantially amended but contains no markings.

### ***Claim Objections***

Claims 1, 9, 15, and 23 are objected to because of the following informalities:

Regarding claim 1, the limitation "and both sides of the gate" is objected to. It is suggested that Applicant amend the claim to read "and on both sides of the gate". Note claims 9, 15, and 23 have similar problems.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Regarding claim 5, it is unclear what is meant by claim 5 since it depends from a cancelled claim. Furthermore, original claim 4 was not a method claim.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 7, 15-17, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smayling et al. (US Pat. 5,275,961, hereinafter Smayling) in view of Baek (US Pat. 6,465,845).

Regarding claims 1, 7, 15, and 21, Figure 16g of Smayling discloses a high voltage device comprising: a substrate 152; first and second wells (630 and 626, respectively) respectively of a first type (p-type) and a second type (n-type) in the substrate; a gate 634 formed on a junction between the first and second wells, without a field oxide between the gate and the first and second wells; first and second doped regions (640 and 642, respectively), respectively formed in the first and second wells and on both sides of the gate; a third doped region 644 of the first type in the first well; and a fourth lightly doped region 636 of the second type adjacent to the first doped region and beneath the gate. Smayling does not appear to disclose the third doped region adjacent to the first doped region. Figure 3I of Baek discloses a high voltage device with first and second wells (34 and 33, respectively) of opposite conductivity type, first and second

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regions (36 and 37, respectively) in the first and second wells, and a third doped region 38 adjacent the first region. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Smayling by having the third doped region adjacent the first doped region as disclosed by Baek. As disclosed in Figure 16h of Smayling, the first and third regions (640 and 644) are connected to the same metal layer by two separate contacts, and are therefore shorted together. Since they are already shorted, placing the regions adjacent to one another so that they can be contacted by a single contact would decrease the lateral space occupied by the device. Decreasing device size is a well-known industry goal. Regarding claim 15, Smayling also discloses the method of making the above device.

Regarding claims 2 and 16, Figure 16g of Smayling discloses field oxides 210 isolating the high voltage device from other devices on the substrate.

Regarding claims 3 and 17, Figure 16g of Smayling discloses a gate oxide 218 on the substrate, a conducting layer 634 on the gate oxide, and spacers 250 on two sides of the gate oxide and conducting layer.

Regarding claim 19, Figure 16g of Smayling discloses there is a spacing of the second doped region 642 to the gate 634.

#### ***Allowable Subject Matter***

Claims 8 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Claims 9-11, 13, 23-25, and 27 would be allowable if rewritten or amended to overcome the claim objections set forth in this Office action.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 8 and 22, the prior art of record, either singularly or in combination, does not disclose or suggest the combination of limitations including the first and second types are respectively N and P types and the high voltage device further comprises a N+ buried layer in the substrate and beneath the first and second wells.

Regarding claims 9 and 23, the prior art of record, either singularly or in combination, does not disclose or suggest the combination of limitations including a N+ buried layer in the P substrate; two second P+ doped regions respectively formed in the second N and P wells, and both sides of the second gate; a second N+ doped region in the second N well and adjacent to the second P+ doped region in the second N well; and a P lightly doped region adjacent to the second P+ doped region in the second N well and beneath the second gate.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1 and 15 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments (see second page of "Remarks" (page 9)), filed May 9, 2005, with respect to the 112, 1<sup>st</sup> paragraph new matter rejections have been fully considered and are persuasive. Therefore, these rejections have been withdrawn.

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***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (571) 272-1731.

The examiner can normally be reached from 8:30 AM - 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should any questions arise regarding access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Matthew C. Landau

Examiner

*Tom Thomas*

**TOM THOMAS  
SUPERVISORY PATENT EXAMINER**

May 26, 2005